

**CLAIMS**

1. A feed plate of at least one fuel cell which includes:

- 5       - apertures for the feeding of fuel (3, 30),  
oxidiser (2, 20) and coolant fluid (4, 40, 54, 59);
- two opposite faces (1A, 1B, 51A, 51B) on at  
least one of which there are the circulation channels  
(21, 22, 61) for the fuel or the oxidiser,
- 10       - at least one refrigeration channel (41, 53)  
located on the same face or faces as that with the  
channels for circulation of the fuel or oxidiser, so as  
to be coplanar with these first circulation channels,
- characterised in that the first channels for  
15 circulation respectively of the fuel (22) and the  
oxidiser (21) are located on both faces (1A, 1B) of the  
plate, with refrigeration taking place on both faces of  
the plate, so that the plate then constitutes a bipolar  
plate, with one single refrigeration channel (41) being  
20 located on both faces (1A, 1B) and, as a consequence,  
having several through passages (43) in the plate, from  
one face to the other, as well as branches (42).

2. A feed plate according to claim 1,  
25 characterised in that the entrance and the exit of the  
refrigeration channel are positioned on the opposite  
face in relation to that where the refrigeration  
channel is located, with the latter passing through the  
thickness of the plate.

3. A feed plate according to claim 1, characterised in that the different circulation channels have entrances and exits grouped together at one set position on the plate, as well as apertures for  
5 the feeding of oxidiser, fuel and coolant fluid.

4. A feed plate according to any of the previous claims, characterised in that the trajectories of the circulation channels (21, 22, 61) and of the  
10 refrigeration channel or channels (41, 53) are interleaved in relation to each other, and so follow the same path.

5. A feed plate according to any of claims 1 to  
15 3, characterised in that the trajectory of the circulation channels (21, 22, 61) is of zigzag form.

6. A feed plate according to any of the previous claims, characterised in that the refrigeration channel  
20 or channels has branches (42, 55) whose entrances and exits are spaced over most of the length of the plate.

7. A feed plate according to any of the previous claims, characterised in that the trajectory of the  
25 circulation channels for the fuel and oxidiser and coolant are parallel with each other, so as to form a comb-like structure.

8. A feed plate according to claims 1 and 7,  
30 characterised in that the channel orientation of one face is offset by  $90^\circ$  in relation to the other.

9. A feed plate according to claims 6 and 8, characterised in that the passage through the plate by the refrigeration channel (41) takes place by means of  
5 through passages (43) at the end of each branch (42), with a change of orientation through  $90^\circ$  for the refrigeration channel at the passage through the plate.

10. A feed plate according to claim 1,  
10 characterised in that it is composed of a corrugated plate (101) so as to form first channels for circulation of the fuel (102) on a first face, interleaved with parallel refrigeration channels (104) on a first face, and second channels for circulation of  
15 the oxidiser (103) interleaved with parallel refrigeration channels (104) on the second face, so that the channels on the first face form separations for the channels of the second face and vice versa, with all of the channels being located in the same  
20 plane, and the plate thus constituting a bipolar plate.

11. A feed plate of the bipolar type according to claim 10, characterised in that the plate is a corrugated sheet, possibly surrounded by a frame,  
25 pierced by feed apertures.

12. A feed plate according to any of claims 1 to 9, characterised in that the refrigeration channel or channels (41, 53), or these branches (42), are  
30 positioned between several channels (21, 22, 61) for the circulation of oxidiser or fuel.

13. A feed plate according to claim 1, characterised in that the coolant fluid is water.

5        14. A feed plate according to any of claims 1 to 9 and 12 and/or 13, characterised in that the plate is made from a polymer-graphite composite.